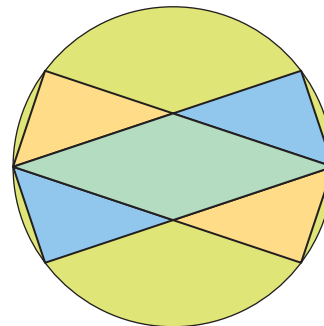


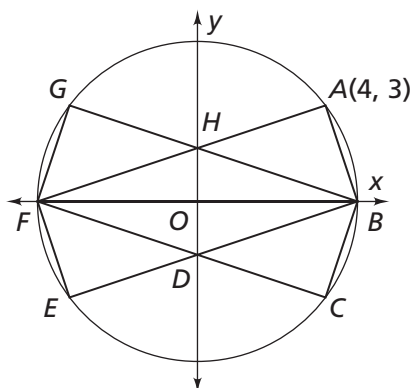
1.2 Parallels and Perpendiculars

The design at the right is made from a circle and two overlapping rectangles. One way to make a crop circle with this design is to place stakes at key points and connect the stakes with string outlining the regions. However, you first need to find the location of these points. You can use what you know about coordinate geometry to analyze the design's key points and features.



Problem 1.2 Parallels and Perpendiculars

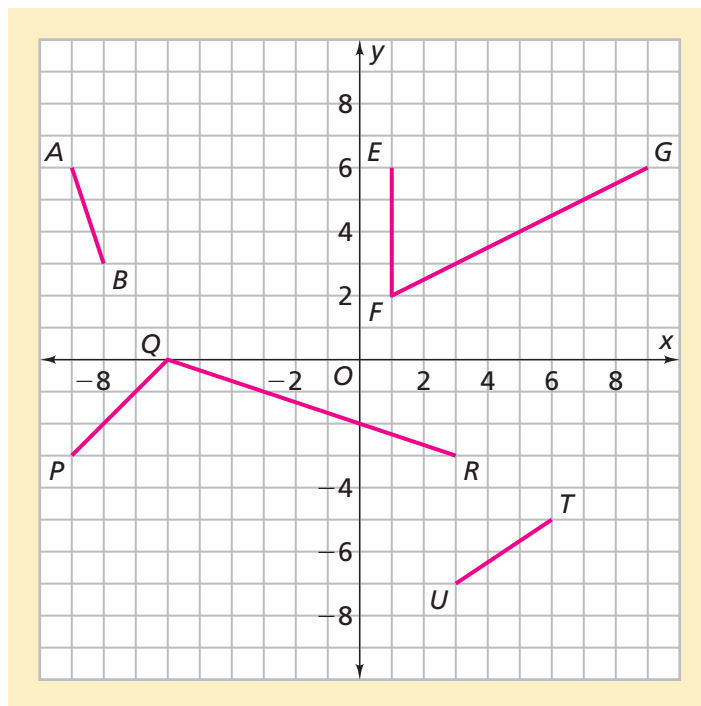
This diagram shows some of the key points in the design. The design has reflection symmetry in both the x -axis and the y -axis. The radius is 5 units.



- Find the coordinates of points B , C , E , F , and G .
- List all pairs of parallel lines. How do the slopes of the lines in each pair compare? Explain why this makes sense.
- List all pairs of perpendicular lines. How do the slopes of the lines in each pair compare? Explain why this makes sense.
- Locate a new point $K(2, y)$ on the circle. Draw a line segment from point K to the point $(5, 0)$. Can you draw a rectangle with this segment as one side and all its vertices on the circle? If so, give the coordinates of the vertices.

E. 1. Kara was sketching on grid paper to try out some design ideas. She got interrupted! On a copy of Kara's diagram below, complete the polygons specified. (There may be more than one way to draw each one.) The polygons should all fit on the grid and should not overlap.

- Rectangle $ABCD$
- Parallelogram $EFGH$
- Parallelogram $PQRS$
- Rectangle $TUVW$



2. Give the coordinates of the vertex points for each figure.
3. Compare the slopes for all pairs of parallel sides. Describe the patterns you see. Are the patterns the same as you found in Question B?
4. Compare the slopes for all pairs of perpendicular sides. Describe the patterns you see. Are the patterns the same as you found in Question C?
5. What is true about the equations for a pair of parallel lines? What is true about the equations for a pair of perpendicular lines?

AC Homework starts on page 12.